

chain nodes :

7 8 9 10 11 12 13 16 25 28 29 31 33 34 35 38 45 46 47 48

ring nodes :

1 2 3 4 5 6 19 20 21 22 23 24 39 40 41 42 43 44

chain bonds :

6-7 7-8 8-9 8-12 9-10 9-11 12-13 28-29 31-33 31-34 34-35 35-38
44-45 45-46 46-47 46-48

ring bonds :

1-2 1-6 2-3 3-4 4-5 5-6 19-20 19-24 20-21 21-22 22-23 23-24
39-40 39-44 40-41 41-42 42-43 43-44

exact/norm bonds :

8-12 9-10 9-11 12-13 31-33 31-34 46-48

exact bonds :

6-7 7-8 8-9 28-29 34-35 35-38 44-45 45-46 46-47

normalized bonds :

1-2 1-6 2-3 3-4 4-5 5-6 19-20 19-24 20-21 21-22 22-23 23-24
39-40 39-44 40-41 41-42 42-43 43-44

isolated ring systems :

containing 1 : 19 : 39 :

Connectivity :

25:1 E exact RC ring/chain 33:1 E exact RC ring/chain

Match level :

1:Atom 2:Atom 3:Atom 4:Atom 5:Atom 6:Atom 7:CLASS 8:CLASS 9:CLASS
10:CLASS 11:CLASS 12:CLASS 13:CLASS 16:CLASS 17:Atom 19:Atom 20:Atom
21:Atom 22:Atom 23:Atom 24:Atom 25:CLASS 27:Atom 28:CLASS 29:CLASS
30:Atom 31:Atom 33:CLASS 34:CLASS 35:CLASS 38:CLASS 39:Atom 40:Atom
41:Atom 42:Atom 43:Atom 44:Atom 45:CLASS 46:CLASS 47:CLASS 48:CLASS
51:Atom

Generic attributes :

31:

Saturation : Unsaturated

Number of Carbon Atoms : less than 7

Number of Hetero Atoms : Exactly 1
Type of Ring System : Monocyclic

fragments assigned reactant role:

containing 1
containing 19

fragments assigned product role:

containing 31

Element Count :

Node 31: Limited
C,C5
N,N1

10555659

Connecting via Winsock to STN

Welcome to STN International! Enter x:x

LOGINID:ssspta1612bxr

PASSWORD:

TERMINAL (ENTER 1, 2, 3, OR ?):2

* * * * * * * * * * Welcome to STN International * * * * * * * * * *

NEWS 1 Web Page URLs for STN Seminar Schedule - N. America
NEWS 2 "Ask CAS" for self-help around the clock
NEWS 3 DEC 18 CA/CAplus pre-1967 chemical substance index entries enhanced with preparation role
NEWS 4 DEC 18 CA/CAplus patent kind codes updated
NEWS 5 DEC 18 MARPAT to CA/CAplus accession number crossover limit increased to 50,000
NEWS 6 DEC 18 MEDLINE updated in preparation for 2007 reload
NEWS 7 DEC 27 CA/CAplus enhanced with more pre-1907 records
NEWS 8 JAN 08 CHEMLIST enhanced with New Zealand Inventory of Chemicals
NEWS 9 JAN 16 CA/CAplus Company Name Thesaurus enhanced and reloaded
NEWS 10 JAN 16 IPC version 2007.01 thesaurus available on STN
NEWS 11 JAN 16 WPIDS/WPINDEX/WPIX enhanced with IPC 8 reclassification data
NEWS 12 JAN 22 CA/CAplus updated with revised CAS roles
NEWS 13 JAN 22 CA/CAplus enhanced with patent applications from India
NEWS 14 JAN 29 PHAR reloaded with new search and display fields
NEWS 15 JAN 29 CAS Registry Number crossover limit increased to 300,000 in multiple databases
NEWS 16 FEB 15 PATDPASPC enhanced with Drug Approval numbers
NEWS 17 FEB 15 RUSSIAPAT enhanced with pre-1994 records
NEWS 18 FEB 23 KOREAPAT enhanced with IPC 8 features and functionality
NEWS 19 FEB 26 MEDLINE reloaded with enhancements
NEWS 20 FEB 26 EMBASE enhanced with Clinical Trial Number field
NEWS 21 FEB 26 TOXCENTER enhanced with reloaded MEDLINE
NEWS 22 FEB 26 IFICDB/IFIPAT/IFIUDB reloaded with enhancements
NEWS 23 FEB 26 CAS Registry Number crossover limit increased from 10,000 to 300,000 in multiple databases
NEWS 24 MAR 15 WPIDS/WPIX enhanced with new FRAGHITSTR display format
NEWS 25 MAR 16 CASREACT coverage extended
NEWS 26 MAR 20 MARPAT now updated daily
NEWS 27 MAR 22 LWPI reloaded
NEWS 28 MAR 30 RDISCLOSURE reloaded with enhancements
NEWS 29 MAR 30 INPADOCDB will replace INPADOC on STN
NEWS 30 APR 02 JICST-EPLUS removed from database clusters and STN

NEWS EXPRESS NOVEMBER 10 CURRENT WINDOWS VERSION IS V8.01c, CURRENT MACINTOSH VERSION IS V6.0c(ENG) AND V6.0Jc(JP), AND CURRENT DISCOVER FILE IS DATED 25 SEPTEMBER 2006.

NEWS HOURS STN Operating Hours Plus Help Desk Availability
NEWS LOGIN Welcome Banner and News Items
NEWS IPC8 For general information regarding STN implementation of IPC 8
NEWS X25 X..25 communication option no longer available

Updated Search

10555659

Enter NEWS followed by the item number or name to see news on that specific topic.

All use of STN is subject to the provisions of the STN Customer agreement. Please note that this agreement limits use to scientific research. Use for software development or design or implementation of commercial gateways or other similar uses is prohibited and may result in loss of user privileges and other penalties.

FILE 'HOME' ENTERED AT 12:51:47 ON 11 APR 2007

=> file reg
COST IN U.S. DOLLARS . SINCE FILE TOTAL
ENTRY SESSION
FULL ESTIMATED COST 0.21 0.21

FILE 'REGISTRY' ENTERED AT 12:51:56 ON 11 APR 2007
USE IS SUBJECT TO THE TERMS OF YOUR STN CUSTOMER AGREEMENT.
PLEASE SEE "HELP USAGETERMS" FOR DETAILS.
COPYRIGHT (C) 2007 American Chemical Society (ACS)

Property values tagged with IC are from the ZIC/VINITI data file provided by InfoChem.

STRUCTURE FILE UPDATES: 10 APR 2007 HIGHEST RN 929680-66-0
DICTIONARY FILE UPDATES: 10 APR 2007 HIGHEST RN 929680-66-0

New CAS Information Use Policies, enter HELP USAGETERMS for details.

TSCA INFORMATION NOW CURRENT THROUGH December 2, 2006

Please note that search-term pricing does apply when conducting SmartSELECT searches.

REGISTRY includes numerically searchable data for experimental and predicted properties as well as tags indicating availability of experimental property data in the original document. For information on property searching in REGISTRY, refer to:

<http://www.cas.org/ONLINE/UG/reqprops.html>

FILE 'CASREACT' ENTERED AT 12:52:00 ON 11 APR 2007
USE IS SUBJECT TO THE TERMS OF YOUR CUSTOMER AGREEMENT
COPYRIGHT (C) 2007 AMERICAN CHEMICAL SOCIETY (ACS)

Copyright of the articles to which records in this database refer is held by the publishers listed in the PUBLISHER (PB) field (available for records published or updated in Chemical Abstracts after December 26, 1996), unless otherwise indicated in the original publications.

FILE CONTENT:1840 - 7 Apr 2007 VOL 146 ISS 16

10555659

New CAS Information Use Policies, enter HELP USAGETERMS for details.

```
*****  
*  
*      CASREACT now has more than 12 million reactions  
*  
*****
```

Some CASREACT records are derived from the ZIC/VINITI database (1974-1999) provided by InfoChem, INPI data prior to 1986, and Biotransformations database compiled under the direction of Professor Dr. Klaus Kieslich.

This file contains CAS Registry Numbers for easy and accurate substance identification.

```
=>  
Uploading C:\Documents and Settings\brobinsone\My  
Documents\stnweb\Queries\erereilk.str
```

L1 STRUCTURE UPLOADED

```
=> s 11  
SAMPLE SEARCH INITIATED 12:59:48 FILE 'CASREACT'  
SCREENING COMPLETE -      452 REACTIONS TO VERIFY FROM      18 DOCUMENTS  
  
100.0% DONE      452 VERIFIED      0 HIT RXNS      0 DOCS  
SEARCH TIME: 00.00.02  
  
FULL FILE PROJECTIONS: ONLINE  **COMPLETE**  
                      BATCH   **COMPLETE**  
PROJECTED VERIFICATIONS:    7765 TO    10315  
PROJECTED ANSWERS:          0 TO      0
```

L2 0 SEA SSS SAM L1 (0 REACTIONS)

```
=> s 11 full  
THE ESTIMATED SEARCH COST FOR FILE 'CASREACT' IS 113.10 U.S. DOLLARS  
DO YOU WANT TO CONTINUE WITH THIS REQUEST? (Y)/N or END:y  
FULL SEARCH INITIATED 12:59:54 FILE 'CASREACT'  
SCREENING COMPLETE -      7232 REACTIONS TO VERIFY FROM      550 DOCUMENTS  
  
100.0% DONE      7232 VERIFIED      12 HIT RXNS      1 DOCS  
SEARCH TIME: 00.00.04
```

L3 1 SEA SSS FUL L1 (12 REACTIONS)

```
=> d 13, all, crxn, 1  
'CRXN' IS NOT A VALID FORMAT FOR FILE 'CASREACT'
```

The following are valid formats:

ABS ----- GI and AB
ALL ----- BIB, AB, IND, RE, Single-step Reactions
APPS ----- AI, PRAI
BIB ----- AN, plus Bibliographic Data
CAN ----- List of CA abstract numbers without answer numbers
CBIB ----- AN, plus Compressed Bibliographic Data
DALL ----- ALL, delimited (end of each field identified)

Updated Search

10555659

IABS ----- ABS, indented with text labels
IALL ----- ALL, indented with text labels
IBIB ----- BIB, indented with text labels
IND ----- Indexing data
IPC ----- International Patent Classifications
ISTD ----- STD, indented with text labels
OBIB ----- AN, plus Bibliographic Data (original)
OIBIB ----- OIBIB, indented with text labels

SBIB ----- BIB, no citations
SIBIB ----- IBIB, no citations

MAX ----- Same as ALL
PATs ----- PI, SO
SCAN ----- TI and FCRD (random display, no answer number. SCAN
must be entered on the same line as DISPLAY, e.g.,
D SCAN.)
SSRX ----- Single-Step Reactions (Map, Diagram, and Summary for
all single-step reactions)
STD ----- BIB, IPC, and NCL

CRD ----- Compact Display of All Hit Reactions
CRDREF ---- Compact Reaction Display and SO, PY for Reference
FHIT ----- Reaction Map, Diagram, and Summary for first
hit reaction
FHITCBIB --- FHIT, AN plus CBIB
FCRD ----- First hit in Compact Reaction Display (CRD) format
FCRDREF --- First hit in Compact Reaction Display (CRD) format with
CA reference information (SO, PY). (Default)
FPATH ----- PATH, plus Reaction Summary for the "long path"
FSPATH ----- SPATH, plus Reaction Summary for the "short path"
HIT ----- Reaction Map, Reaction Diagram, and Reaction
Summary for all hit reactions and fields containing
hit terms
OCC ----- All hit fields and the number of occurrences of the
hit terms in each field. Includes total number of
HIT, PATH, SPATH reactions. Labels reactions that have
incomplete verifications.
PATH ----- Reaction Map and Reaction Diagram for the "long
path". Displays all hit reactions, except those
whose steps are totally included within another hit
reaction which is displayed
RX ----- Hit Reactions (Map, Diagram, Summary for all hit reactions)
RXG ----- Hit Reaction Graphics (Map and Diagram for all hit reactions)
RXL ----- Hit Reaction Long (Map, Diagram, Summary for all hit reactions)
RXS ----- Hit Reaction Summariers (Map and Summary for all hit reactions).
SPATH ----- Reaction Map and Reaction Diagram for the "short
path". Displays all single step reactions which
contain a hit substance. Also displays those
multistep reactions that have a hit substance in both
the first and last steps of the reaction, except for
those hit reactions whose steps are totally included
within another hit reaction which is displayed

To display a particular field or fields, enter the display field
codes. For a list of the display field codes, enter HELP DFIELDS
at an arrow prompt (>). Examples of combinations include: D TI;
D BIB RX; D TI, AU, FCRD. The information is displayed in the same order
as the specification. All of the formats, except CRD, CRDREF, FHIT, PATH,

10555659

FPATH, SPATH, FSPATH, FCRD, FCRDREF, HIT, RX, RXG, RXS, SCAN, and OCC, may be used with the DISPLAY command to display the record for a specified Accession Number.

ENTER DISPLAY FORMAT (FCRDREF):end

=> d his

(FILE 'HOME' ENTERED AT 12:51:47 ON 11 APR 2007)

FILE 'REGISTRY' ENTERED AT 12:51:56 ON 11 APR 2007

FILE 'CASREACT' ENTERED AT 12:52:00 ON 11 APR 2007

L1 STRUCTURE UPLOADED
L2 0 S L1
L3 1 S L1 FULL

=> d 13, ibib abs crd, 1

L3 ANSWER 1 OF 1 CASREACT COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 141:424428 CASREACT
TITLE: Intermediate compound, namely O-[2-(5-ethylpyridin-2-yl)ethyl]tyrosine, which is used for the preparation of the antidiabetic agent pioglitazone, and methods for its preparation and conversion to pioglitazone
INVENTOR(S): Duran, Lopez Ernesto
PATENT ASSIGNEE(S): Medichem, S.A., Spain
SOURCE: PCT Int. Appl., 26 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: Spanish
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|--|------|-------------------|-----------------|----------|
| WO 2004099147 | A1 | 20041118 | WO 2004-ES70031 | 20040504 |
| W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH,
CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD,
GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC,
LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI,
NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY,
TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW | | | | |
| RW: BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM,
AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK,
EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE,
SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE,
SN, TD, TG | | | | |
| ES 2219180 | A1 | 20041116 | ES 2003-1075 | 20030509 |
| ES 2219180 | B1 | 20060301 | | |
| CA 2525190 | A1 | 20041118 | CA 2004-2525190 | 20040504 |
| EP 1623977 | A1 | 20060208 | EP 2004-731028 | 20040504 |
| R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT,
IE, SI, FI, RO, CY, TR, BG, CZ, EE, HU, PL, SK | | | | |
| PRIORITY APPLN. INFO.: | | | ES 2003-1075 | 20030509 |
| | | | WO 2004-ES70031 | 20040504 |
| OTHER SOURCE(S): | | MARPAT 141:424428 | | |
| GI | | | | |

* STRUCTURE DIAGRAM TOO LARGE FOR DISPLAY - AVAILABLE VIA OFFLINE PRINT *

AB The invention relates to the novel O-substituted tyrosine derivative I, including pure or mixed enantiomers, racemates, salts, solvates, and hydrates. I and its stereoisomers and compds. are new key intermediates for the preparation of the antidiabetic agent pioglitazone (II). The invention also relates to a method of obtaining I from a natural product, L-tyrosine, in which the amino group, in the form of an aromatic imine group, is protected by an aldehyde or ketone. The invention further relates to a method of obtaining II from the intermediate compound I. The critical feature of the invention is protection of the tyrosine N-terminal as an imine, which allows etherification of the phenolic tyrosine OH group to occur without competing N-alkylation. Complete racemization during the process allows the more desirable racemic I to be prepared from the more readily available L-tyrosine. For instance, L-tyrosine was treated with SOC12 in refluxing MeOH to give the Me ester, which was treated with PhCHO at room temperature in CH2C12 to give doubly protected tyrosine III. This phenolic compound was etherified with the mesylate IV (preparation given) using K2CO3

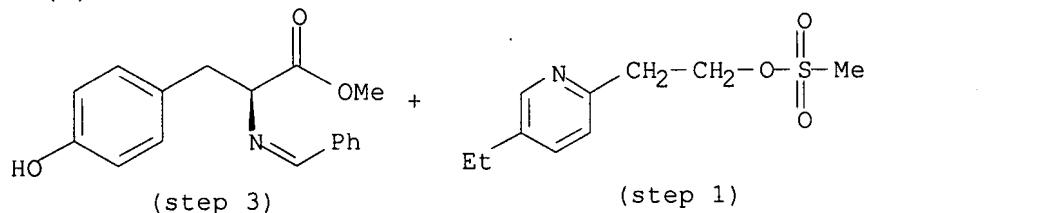
and

Bu4N+Br- in PhMe at 70°, and the protected product was deprotected in situ first with acid (2N HCl) and then with base (50% NaOH), both at 70°, to give racemic I in 62.8% overall yield from L-tyrosine.

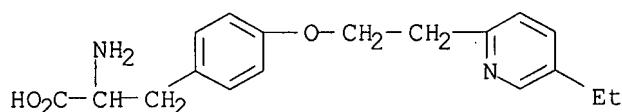
Diazotization of the amino group in I in the presence of HBr gave the corresponding bromo compound, which was cyclized with thiourea to give the 2-imine derivative of II. Acid hydrolysis of the imine in refluxing aqueous HCl

gave II in 40.7% yield from I. Four comparative processes for preparing I, using other standard amine protecting groups instead of a benzaldehyde imine, were examined. Overall yields of I from L-tyrosine were 24.1% for Boc, 20.7% for Cbz, 11.5% for Ac, and poor (unisolated) for EtOCO, vs. 62.8% for benzylidene.

RX(1) OF 80



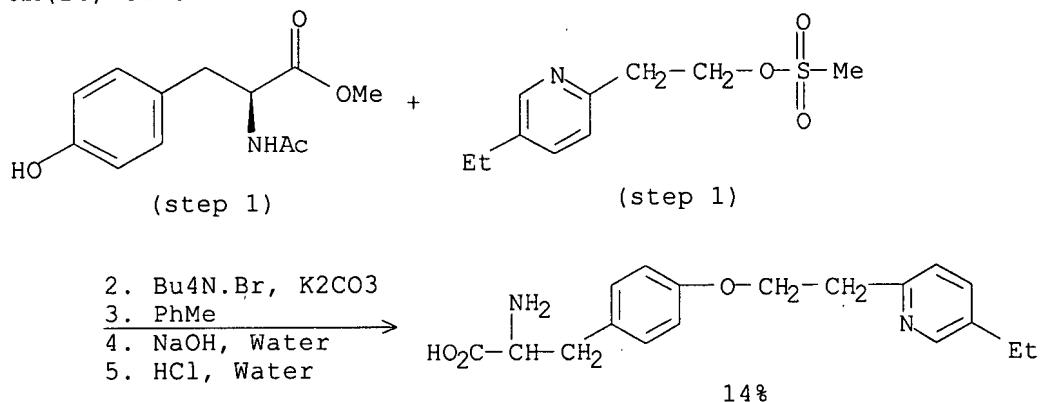
1. PhMe
2. Bu4N.Br, K2CO3
4. PhMe
5. K2CO3
6. Bu4N.Br
7. HCl, Water
8. NaOH, Water
9. HCl, Water



NOTE: last stage neutralization

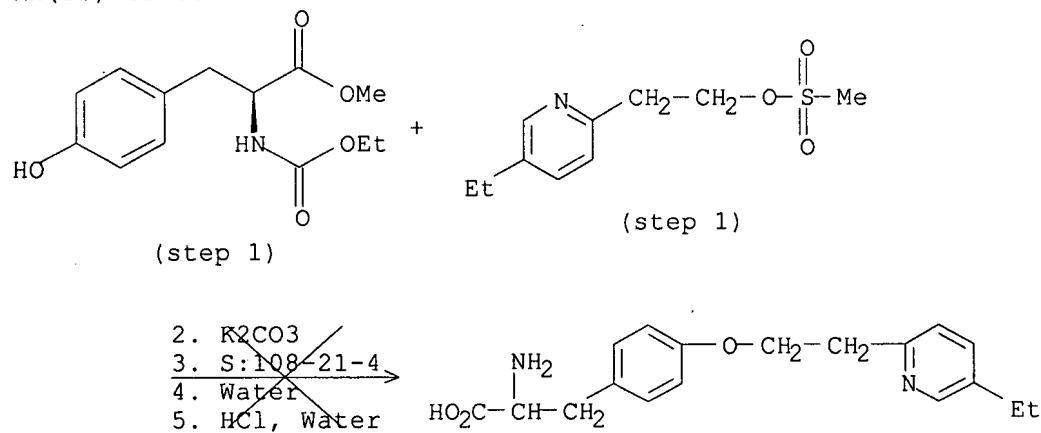
10555659

RX(14) OF 80



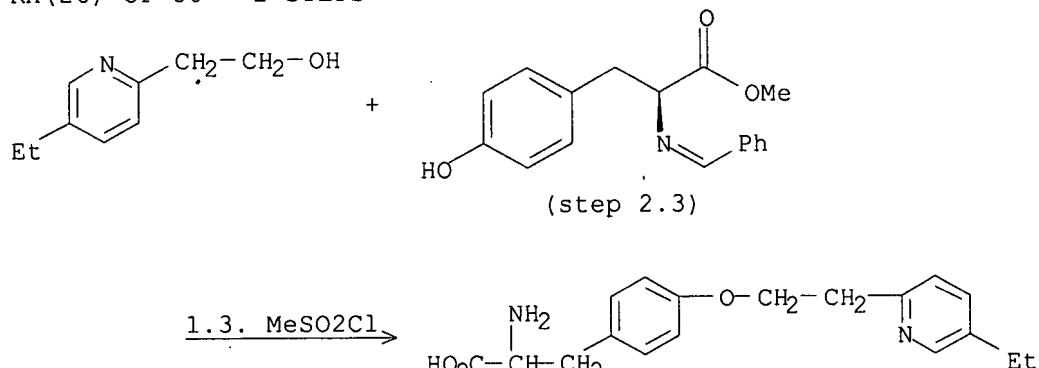
NOTE: last stage neutralization

RX(16) OF 80



10555659

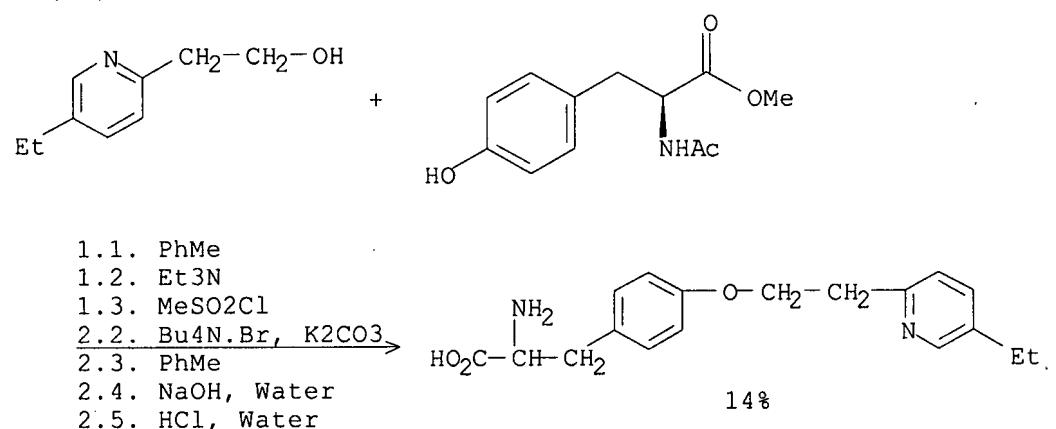
RX(26) OF 80 - 2 STEPS



NOTE: 2) last stage neutralization

CON: STEP(1.1) room temperature
STEP(1.2) room temperature \rightarrow 0 deg C
STEP(1.3) 75 minutes, 0 - 10 deg C; 10 deg C \rightarrow room temperature;
1 hour, room temperature

RX(29) OF 80 - 2 STEPS

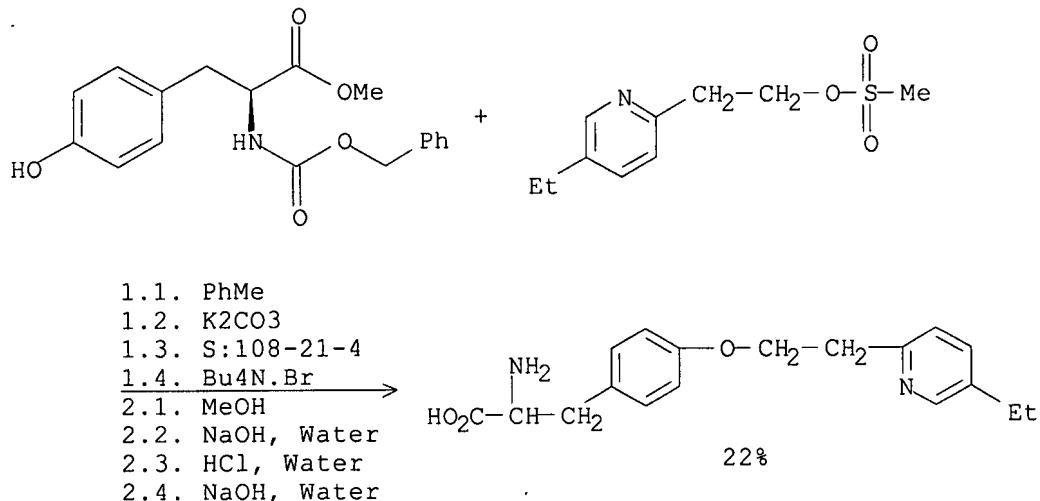


NOTE: 2) last stage neutralization

CON: STEP(1.1) room temperature
STEP(1.2) room temperature \rightarrow 0 deg C
STEP(1.3) 75 minutes, 0 - 10 deg C; 10 deg C \rightarrow room temperature;
1 hour, room temperature

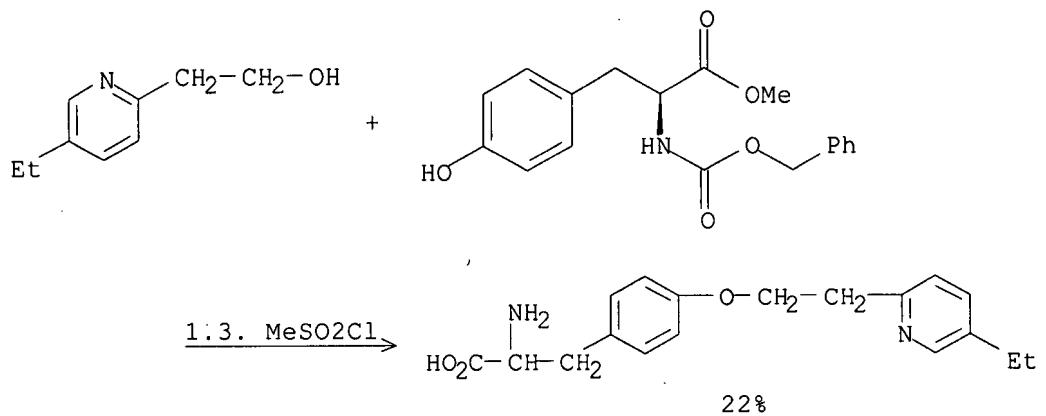
10555659

RX (34) OF 80 - 2 STEPS



NOTE: 2) last stage neutralization

RX (48) OF 80 - 3 STEPS



NOTE: 3) last stage neutralization

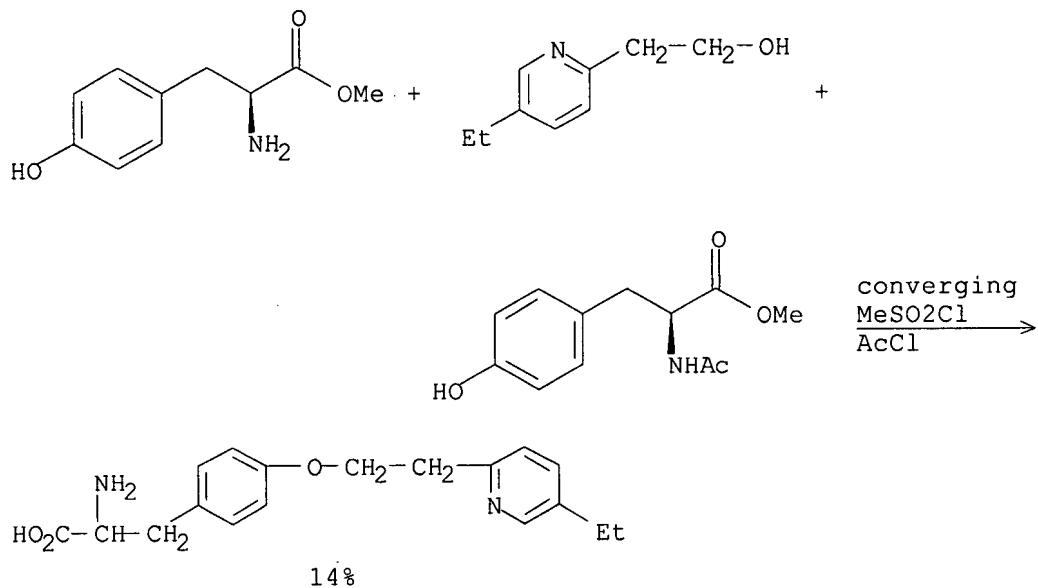
CON: STEP(1.1) room temperature

STEP(1.2) room temperature -> 0 deg C

STEP(1.3) 75 minutes, 0 - 10 deg C; 10 deg C -> room temperature;
1 hour, room temperature

10555659

RX (49) OF 80 - 3 STEPS



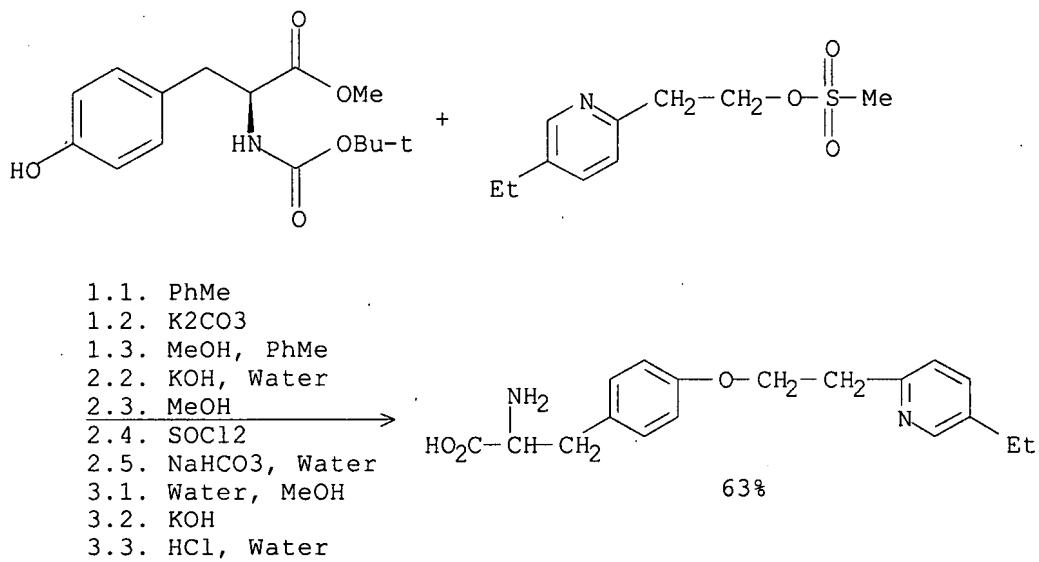
NOTE: last stage neutralization

CON: STEP(1.1) room temperature

STEP(1.2) room temperature \rightarrow 0 deg C

STEP(1.3) 75 minutes, 0 - 10 deg C; 10 deg C \rightarrow room temperature;
1 hour, room temperature

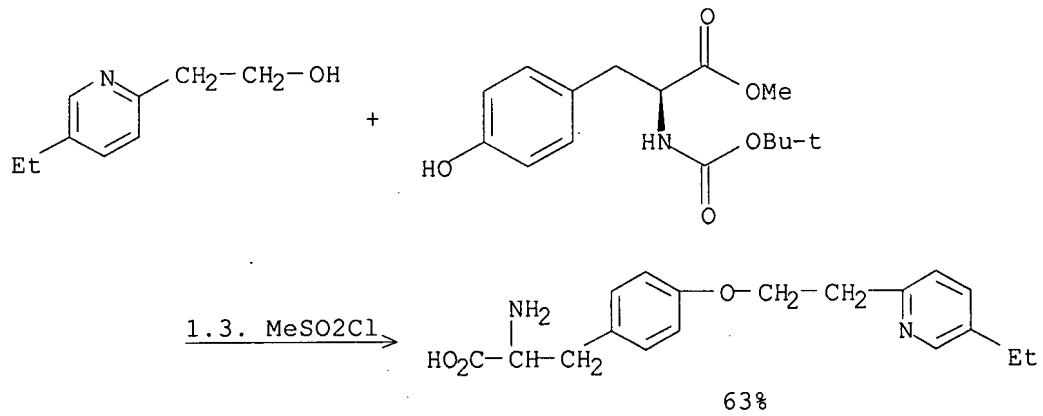
RX (53) OF 80 - 3 STEPS



NOTE: 3) last stage neutralization

10555659

RX(54) OF 80 - 4 STEPS



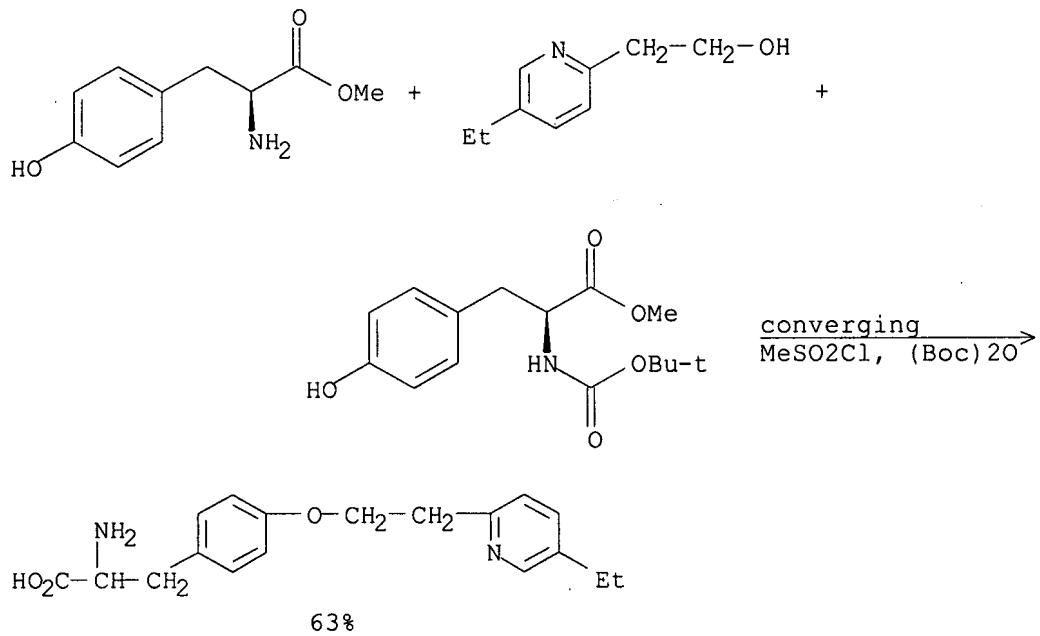
NOTE: 4) last stage neutralization

CON: STEP(1.1) room temperature

STEP(1.2) room temperature \rightarrow 0 deg C

STEP(1.3) 75 minutes, 0 - 10 deg C; 10 deg C \rightarrow room temperature;
1 hour, room temperature

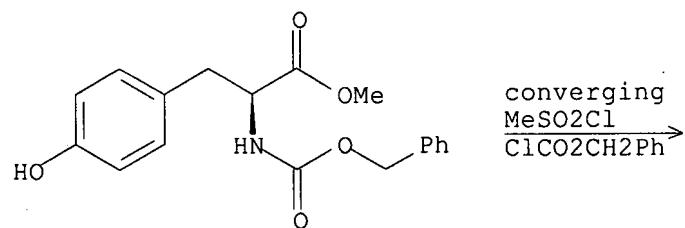
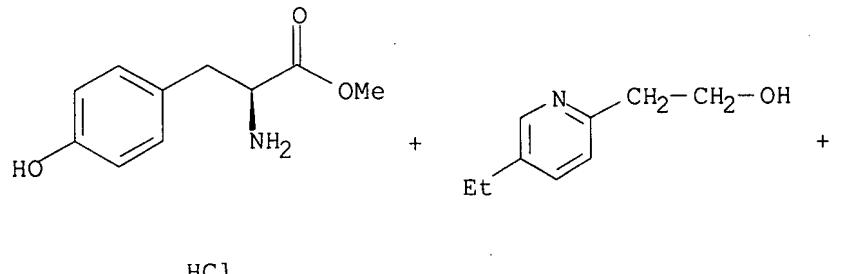
RX(70) OF 80 - 5 STEPS



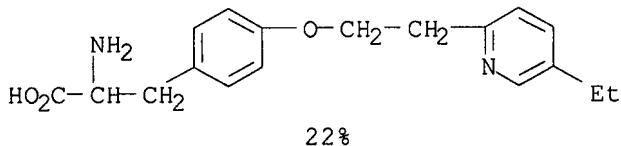
10555659

NOTE: last stage neutralization, last stage quench
CON: STEP(1.1) room temperature
STEP(1.2) room temperature -> 0 deg C
STEP(1.3) 75 minutes, 0 - 10 deg C; 10 deg C -> room temperature;
1 hour, room temperature

RX(72) OF 80 - 4 STEPS



RX(72) OF 80 - 4 STEPS



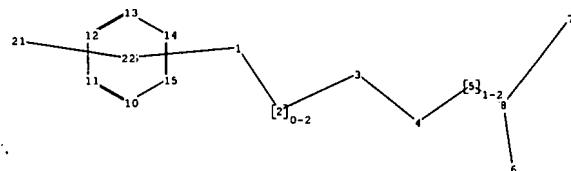
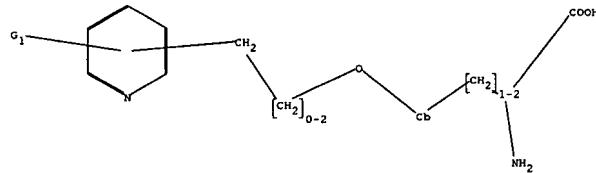
22%

NOTE: last stage neutralization
CON: STEP(1.1) room temperature
STEP(1.2) room temperature -> 0 deg C
STEP(1.3) 75 minutes, 0 - 10 deg C; 10 deg C -> room temperature;
1 hour, room temperature

REFERENCE COUNT:

5

THERE ARE 5 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT



```

chain nodes :
 1 2 3 4 5 6 7 8 21
ring nodes :
 10 11 12 13 14 15
chain bonds :
 1-2 2-3 3-4 4-5 5-8 6-8 7-8
ring bonds :
 10-11 10-15 11-12 12-13 13-14 14-15
exact/norm bonds :
 6-8
exact bonds :
 1-2 2-3 3-4 4-5 5-8 7-8
normalized bonds :
 10-11 10-15 11-12 12-13 13-14 14-15
isolated ring systems :
  containing 10 :

```

G1:CH3,Et

```

Match level :
 1:CLASS 2:CLASS 3:CLASS 4:Atom 5:CLASS 6:CLASS 7:CLASS 8:CLASS
 10:Atom 11:Atom 12:Atom 13:Atom 14:Atom 15:CLASS 16:CLASS 21:CLASS
 22:Atom
Generic attributes :
 4:
  Saturation : Unsaturated
  Number of Carbon Atoms : less than 7
  Type of Ring System : Polycyclic

```

```

Element Count :
  Node 4: Limited
    C,C6

```

10555659

Connecting via Winsock to STN

Welcome to STN International! Enter x:x

LOGINID:ssspta1612bxr

PASSWORD:

* * * * * RECONNECTED TO STN INTERNATIONAL * * * * *

SESSION RESUMED IN FILE 'CAOLD' AT 20:13:56 ON 02 APR 2007

FILE 'CAOLD' ENTERED AT 20:13:56 ON 02 APR 2007

COPYRIGHT (C) 2007 AMERICAN CHEMICAL SOCIETY (ACS)

| COST IN U.S. DOLLARS | SINCE FILE ENTRY | TOTAL SESSION |
|----------------------|------------------|---------------|
|----------------------|------------------|---------------|

| | | |
|---------------------|------|---------|
| FULL ESTIMATED COST | 0.45 | 1424.50 |
|---------------------|------|---------|

| DISCOUNT AMOUNTS (FOR QUALIFYING ACCOUNTS) | SINCE FILE ENTRY | TOTAL SESSION |
|--|------------------|---------------|
|--|------------------|---------------|

| | | |
|---------------------|------|-------|
| CA SUBSCRIBER PRICE | 0.00 | -1.56 |
|---------------------|------|-------|

=> file reg

| COST IN U.S. DOLLARS | SINCE FILE ENTRY | TOTAL SESSION |
|----------------------|------------------|---------------|
|----------------------|------------------|---------------|

| | | |
|---------------------|------|---------|
| FULL ESTIMATED COST | 0.45 | 1424.50 |
|---------------------|------|---------|

| DISCOUNT AMOUNTS (FOR QUALIFYING ACCOUNTS) | SINCE FILE ENTRY | TOTAL SESSION |
|--|------------------|---------------|
|--|------------------|---------------|

| | | |
|---------------------|------|-------|
| CA SUBSCRIBER PRICE | 0.00 | -1.56 |
|---------------------|------|-------|

FILE 'REGISTRY' ENTERED AT 20:14:05 ON 02 APR 2007

USE IS SUBJECT TO THE TERMS OF YOUR STN CUSTOMER AGREEMENT.

PLEASE SEE "HELP USAGETERMS" FOR DETAILS.

COPYRIGHT (C) 2007 American Chemical Society (ACS)

Property values tagged with IC are from the ZIC/VINITI data file provided by InfoChem.

STRUCTURE FILE UPDATES: 1 APR 2007 HIGHEST RN 928822-97-3
DICTIONARY FILE UPDATES: 1 APR 2007 HIGHEST RN 928822-97-3

New CAS Information Use Policies, enter HELP USAGETERMS for details.

TSCA INFORMATION NOW CURRENT THROUGH December 2, 2006

Please note that search-term pricing does apply when conducting SmartSELECT searches.

REGISTRY includes numerically searchable data for experimental and predicted properties as well as tags indicating availability of experimental property data in the original document. For information on property searching in REGISTRY, refer to:

<http://www.cas.org/ONLINE/UG/regprops.html>

=>
Uploading C:\Documents and Settings\brobinson1\My Documents\stnweb\Queries\1212lkj.str

Updated Search

10555659

L41 STRUCTURE UPLOADED

=> s 141
SAMPLE SEARCH INITIATED 20:17:53 FILE 'REGISTRY'
SAMPLE SCREEN SEARCH COMPLETED - 62928 TO ITERATE

3.2% PROCESSED 2000 ITERATIONS 0 ANSWERS
INCOMPLETE SEARCH (SYSTEM LIMIT EXCEEDED)
SEARCH TIME: 00.00.01

FULL FILE PROJECTIONS: ONLINE **INCOMPLETE**
BATCH **COMPLETE**
PROJECTED ITERATIONS: 1243614 TO 1273506
PROJECTED ANSWERS: 0 TO 0

L42 0 SEA SSS SAM L41

=>
Uploading C:\Documents and Settings\brobinson1\My Documents\stnweb\Queries\2323k.str

L43 STRUCTURE UPLOADED

=> s 143
SAMPLE SEARCH INITIATED 20:19:30 FILE 'REGISTRY'
SAMPLE SCREEN SEARCH COMPLETED - 62805 TO ITERATE

3.2% PROCESSED 2000 ITERATIONS 0 ANSWERS
INCOMPLETE SEARCH (SYSTEM LIMIT EXCEEDED)
SEARCH TIME: 00.00.01

FULL FILE PROJECTIONS: ONLINE **INCOMPLETE**
BATCH **COMPLETE**
PROJECTED ITERATIONS: 1241169 TO 1271031
PROJECTED ANSWERS: 0 TO 0

L44 0 SEA SSS SAM L43

=>
Uploading C:\Documents and Settings\brobinson1\My Documents\stnweb\Queries\45454lpi.str

L45 STRUCTURE UPLOADED

=> s 145
SAMPLE SEARCH INITIATED 20:23:26 FILE 'REGISTRY'
SAMPLE SCREEN SEARCH COMPLETED - 2951 TO ITERATE

67.8% PROCESSED 2000 ITERATIONS 0 ANSWERS
INCOMPLETE SEARCH (SYSTEM LIMIT EXCEEDED)
SEARCH TIME: 00.00.01

FULL FILE PROJECTIONS: ONLINE **COMPLETE**
BATCH **COMPLETE**
PROJECTED ITERATIONS: 55762 TO 62278
PROJECTED ANSWERS: 0 TO 0

L46 0 SEA SSS SAM L45

Updated Search

10555659

=> s 145 full

THE ESTIMATED SEARCH COST FOR FILE 'REGISTRY' IS 171.65 U.S. DOLLARS

DO YOU WANT TO CONTINUE WITH THIS REQUEST? (Y)/N or END:y

FULL SEARCH INITIATED 20:23:30 FILE 'REGISTRY'

FULL SCREEN SEARCH COMPLETED - 58334 TO ITERATE

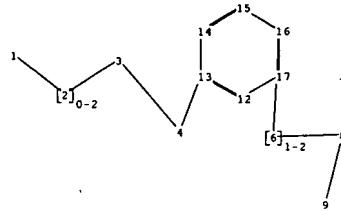
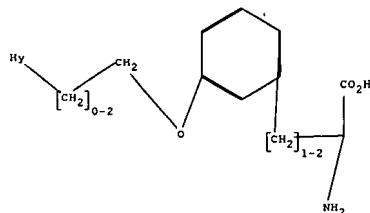
100.0% PROCESSED 58334 ITERATIONS

0 ANSWERS

SEARCH TIME: 00.00.01

L47

0 SEA SSS FUL L45



```

chain nodes :
 1 2 3 4 6 7 8 9
ring nodes :
 12 13 14 15 16 17
chain bonds :
 1-2 2-3 3-4 4-13 6-8 6-16 7-8 8-9
ring bonds :
 12-13 12-17 13-14 14-15 15-16 16-17
exact/norm bonds :
 1-2 4-13 8-9
exact bonds :
 2-3 3-4 6-8 6-16 7-8
normalized bonds :
 12-13 12-17 13-14 14-15 15-16 16-17

```

```

Match level :
 1:Atom 2:CLASS 3:CLASS 4:CLASS 6:CLASS 7:CLASS 8:CLASS 9:CLASS
 12:Atom 13:Atom 14:CLASS 15:CLASS 16:Atom 17:Atom

```

```

Generic attributes :
 1:
 Saturation : Unsaturated
 Number of Carbon Atoms : less than 7
 Number of Hetero Atoms : Exactly 1
 Type of Ring System : Monocyclic

```

```

Element Count :
 Node 1: Limited
 C,C5
 N,N1

```

10555659

Connecting via Winsock to STN

Welcome to STN International! Enter x:x

LOGINID: ssspta1612bxr

PASSWORD:

TERMINAL (ENTER 1, 2, 3, OR ?):2

Updated Search

10555659

Enter NEWS followed by the item number or name to see news on that specific topic.

All use of STN is subject to the provisions of the STN Customer agreement. Please note that this agreement limits use to scientific research. Use for software development or design or implementation of commercial gateways or other similar uses is prohibited and may result in loss of user privileges and other penalties.

FILE 'HOME' ENTERED AT 11:09:18 ON 09 APR 2007

=> file reg
COST IN U.S. DOLLARS SINCE FILE TOTAL
ENTRY SESSION
FULL ESTIMATED COST 0.42 0.42

FILE 'REGISTRY' ENTERED AT 11:10:08 ON 09 APR 2007
USE IS SUBJECT TO THE TERMS OF YOUR STN CUSTOMER AGREEMENT.
PLEASE SEE "HELP USAGETERMS" FOR DETAILS.
COPYRIGHT (C) 2007 American Chemical Society (ACS)

Property values tagged with IC are from the ZIC/VINITI data file provided by InfoChem.

STRUCTURE FILE UPDATES: 8 APR 2007 HIGHEST RN 929518-97-8
DICTIONARY FILE UPDATES: 8 APR 2007 HIGHEST RN 929518-97-8

New CAS Information Use Policies, enter HELP USAGETERMS for details.

TSCA INFORMATION NOW CURRENT THROUGH December 2, 2006

Please note that search-term pricing does apply when conducting SmartSELECT searches.

REGISTRY includes numerically searchable data for experimental and predicted properties as well as tags indicating availability of experimental property data in the original document. For information on property searching in REGISTRY, refer to:

<http://www.cas.org/ONLINE/UG/regprops.html>

=>
Uploading C:\Documents and Settings\brobins01\My
Documents\stnweb\Queries\565659o1.str

I.1 STRUCTURE UPLOADED

```
=> s 11 full
THE ESTIMATED SEARCH COST FOR FILE 'REGISTRY' IS 171.65 U.S. DOLLARS
DO YOU WANT TO CONTINUE WITH THIS REQUEST? (Y)/N or END:y
FULL SEARCH INITIATED 11:15:04 FILE 'REGISTRY'
FULL SCREEN SEARCH COMPLETED - 1254466 TO ITERATE
```

64.9% PROCESSED 813553 ITERATIONS 9 ANSWERS
79.7% PROCESSED 1000000 ITERATIONS 13 ANSWERS

10555659

INCOMPLETE SEARCH (SYSTEM LIMIT EXCEEDED)

SEARCH TIME: 00.00.31

FULL FILE PROJECTIONS: ONLINE **INCOMPLETE**
BATCH **COMPLETE**
PROJECTED ITERATIONS: 1254466 TO 1254466
PROJECTED ANSWERS: 13 TO 28

L2 13 SEA SSS FUL L1

=>

Uploading C:\Documents and Settings\brobinson1\My Documents\stnweb\Queries\34ae34.str

L3 STRUCTURE UPLOADED

=> s 13
SAMPLE SEARCH INITIATED 11:16:43 FILE 'REGISTRY'
SAMPLE SCREEN SEARCH COMPLETED - 1708 TO ITERATE

100.0% PROCESSED 1708 ITERATIONS 0 ANSWERS
SEARCH TIME: 00.00.01

FULL FILE PROJECTIONS: ONLINE **COMPLETE**
BATCH **COMPLETE**
PROJECTED ITERATIONS: 31681 TO 36639
PROJECTED ANSWERS: 0 TO 0

L4 0 SEA SSS SAM L3

=> s 13 full
THE ESTIMATED SEARCH COST FOR FILE 'REGISTRY' IS 171.65 U.S. DOLLARS
DO YOU WANT TO CONTINUE WITH THIS REQUEST? (Y)/N or END:y
FULL SEARCH INITIATED 11:16:48 FILE 'REGISTRY'
FULL SCREEN SEARCH COMPLETED - 34029 TO ITERATE

100.0% PROCESSED 34029 ITERATIONS 14 ANSWERS
SEARCH TIME: 00.00.01

L5 14 SEA SSS FUL L3

=> file hcaplus
COST IN U.S. DOLLARS SINCE FILE TOTAL
ENTRY SESSION
FULL ESTIMATED COST 348.25 348.67

FILE 'HCAPLUS' ENTERED AT 11:16:52 ON 09 APR 2007
USE IS SUBJECT TO THE TERMS OF YOUR STN CUSTOMER AGREEMENT.
PLEASE SEE "HELP USAGETERMS" FOR DETAILS.
COPYRIGHT (C) 2007 AMERICAN CHEMICAL SOCIETY (ACS)

Copyright of the articles to which records in this database refer is held by the publishers listed in the PUBLISHER (PB) field (available for records published or updated in Chemical Abstracts after December 26, 1996), unless otherwise indicated in the original publications. The CA Lexicon is the copyrighted intellectual property of the American Chemical Society and is provided to assist you in searching databases on STN. Any dissemination, distribution, copying, or storing

Updated Search

10555659

of this information, without the prior written consent of CAS, is strictly prohibited.

FILE COVERS 1907 - 9 Apr 2007 VOL 146 ISS 16
FILE LAST UPDATED: 8 Apr 2007 (20070408/ED)

New CAS Information Use Policies, enter HELP USAGETERMS for details.

This file contains CAS Registry Numbers for easy and accurate substance identification.

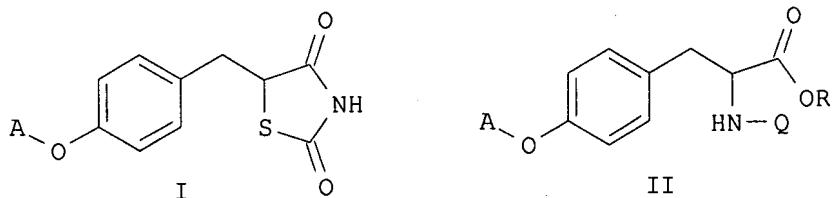
=> s 15
L6 7 L5

=> s 16 and duran, e?/au
115 DURAN, E?/AU
L7 0 L6 AND DURAN, E?/AU

=> d 16, ibib abs hitstr, 1-7

L6 ANSWER 1 OF 7 HCPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2004:1016040 HCPLUS
DOCUMENT NUMBER: 141:424180
TITLE: Processes for making thiazolidinedione derivatives and compounds thereof
INVENTOR(S): Pospisilik, Karel; Zhu, Jie; Picha, Frantisek
PATENT ASSIGNEE(S): Synthon B.V., Neth.
SOURCE: PCT Int. Appl., 47 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|--|--------|------------|------------------|------------|
| WO 2004101560 | A1 | 20041125 | WO 2004-EP5026 | 20040511 |
| W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH,
CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD,
GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC,
LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI,
NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY,
TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW | | | | |
| RW: BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM,
AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK,
EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE,
SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE,
SN, TD, TG | | | | |
| US 2005059708 | A1 | 20050317 | US 2004-842635 | 20040511 |
| EP 1622898 | A1 | 20060208 | EP 2004-732115 | 20040511 |
| R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT,
IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, PL, SK, HR | | | | |
| CN 1812988 | A | 20060802 | CN 2004-80018359 | 20040511 |
| JP 2007502847 | T | 20070215 | JP 2006-529780 | 20040511 |
| PRIORITY APPLN. INFO.: | | | US 2003-469837P | P 20030513 |
| OTHER SOURCE(S): GI | MARPAT | 141:424180 | WO 2004-EP5026 | W 20040511 |



AB The invention relates processes for the synthesis of thiazolidinedione derivs. I (A is ethyl-2-pyridylethyl, [(2-pyridyl)methylamino]ethyl or [3,4-dihydro-6-hydroxy-2,5,7,8-tetramethyl-2H-1-benzopyran-2-yl)methyl] via reactions of amino acid intermediates II (same A, R is H or alkyl, Q is H or an amine-protecting group). The synthesis of pioglitazone is illustrated. Thus, 2-amino-3-[4-[2-(5-ethyl-2-pyridyl)ethoxy]phenyl]propionic acid, prepared by O-alkylation of L-tyrosine, underwent diazotization reaction to give the 2-bromo derivative which underwent cyclocondensation with thiourea to afford pioglitazone (isolated as the HCl salt).

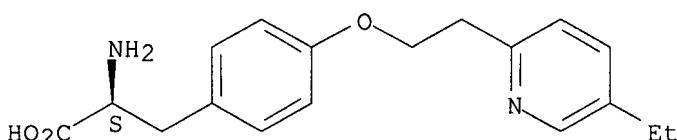
IT 794591-56-3P

RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(Processes for making thiazolidinedione derivs. and compds. thereof)

RN 794591-56-3 HCPLUS

CN L-Tyrosine, O-[2-(5-ethyl-2-pyridinyl)ethyl]- (9CI) (CA INDEX NAME)

Absolute stereochemistry.



REFERENCE COUNT: 8 THERE ARE 8 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L6 ANSWER 2 OF 7 HCPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 2004:996131 HCPLUS

DOCUMENT NUMBER: 141:424428

TITLE: Intermediate compound, namely O-[2-(5-ethylpyridin-2-yl)ethyl]tyrosine, which is used for the preparation of the antidiabetic agent pioglitazone, and methods for its preparation and conversion to pioglitazone

INVENTOR(S): Duran, Lopez Ernesto

PATENT ASSIGNEE(S): Medicem, S.A., Spain

SOURCE: PCT Int. Appl., 26 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: Spanish

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---------------|------|----------|-----------------|----------|
| WO 2004099147 | A1 | 20041118 | WO 2004-ES70031 | 20040504 |

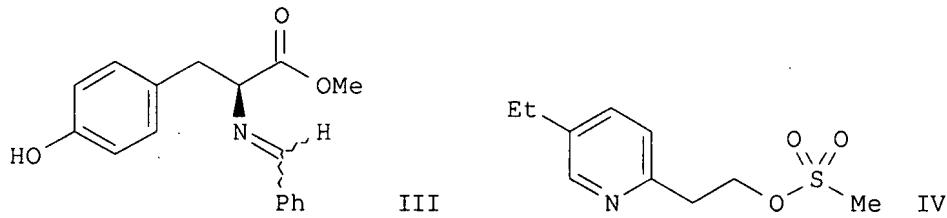
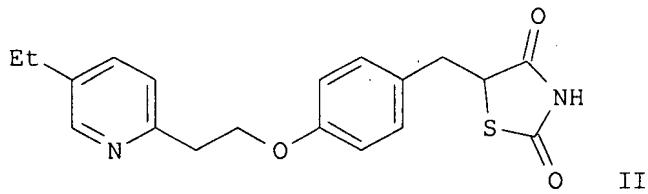
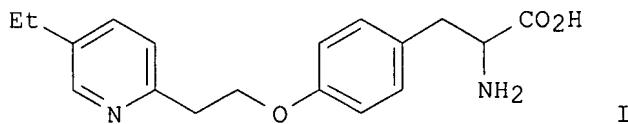
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH,
 CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD,
 GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC,
 LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI,
 NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY,
 TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW
 RW: BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM,
 AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK,
 EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE,
 SI, SK, TR, BF, BJ, CF, CI, CM, GA, GN, GQ, GW, ML, MR, NE,
 SN, TD, TG

ES 2219180 A1 20041116 ES 2003-1075 20030509
 ES 2219180 B1 20060301
 CA 2525190 A1 20041118 CA 2004-2525190 20040504
 EP 1623977 A1 20060208 EP 2004-731028 20040504

R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT,
 IE, SI, FI, RO, CY, TR, BG, CZ, EE, HU, PL, SK

PRIORITY APPLN. INFO.: ES 2003-1075 A 20030509
 WO 2004-ES70031 W 20040504

OTHER SOURCE(S): CASREACT 141:424428; MARPAT 141:424428
 GI



AB The invention relates to the novel O-substituted tyrosine derivative I, including pure or mixed enantiomers, racemates, salts, solvates, and hydrates. I and its stereoisomers and compds. are new key intermediates for the preparation of the antidiabetic agent pioglitazone (II). The invention also relates to a method of obtaining I from a natural product, L-tyrosine, in which the amino group, in the form of an aromatic imine group,

is protected by an aldehyde or ketone. The invention further relates to a method of obtaining II from the intermediate compound I. The critical feature of the invention is protection of the tyrosine N-terminal as an imine, which allows etherification of the phenolic tyrosine OH group to occur without competing N-alkylation. Complete racemization during the process allows the more desirable racemic I to be prepared from the more readily available L-tyrosine. For instance, L-tyrosine was treated with SOC₁₂ in refluxing MeOH to give the Me ester, which was treated with PhCHO at room temperature in CH₂Cl₂ to give doubly protected tyrosine III. This phenolic compound was etherified with the mesylate IV (preparation given) using K₂CO₃

and

Bu₄N⁺Br⁻ in PhMe at 70°, and the protected product was deprotected in situ first with acid (2N HCl) and then with base (50% NaOH), both at 70°, to give racemic I in 62.8% overall yield from L-tyrosine. Diazotization of the amino group in I in the presence of HBr gave the corresponding bromo compound, which was cyclized with thiourea to give the 2-imine derivative of II. Acid hydrolysis of the imine in refluxing aqueous

HCl

gave II in 40.7% yield from I. Four comparative processes for preparing I, using other standard amine protecting groups instead of a benzaldehyde imine, were examined. Overall yields of I from L-tyrosine were 24.1% for Boc, 20.7% for Cbz, 11.5% for Ac, and poor (unisolated) for EtOCO, vs. 62.8% for benzylidene.

IT 795316-22-2P, O-[2-(5-Ethylpyridin-2-yl)ethyl]-DL-tyrosine

RL: IMF (Industrial manufacture); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)

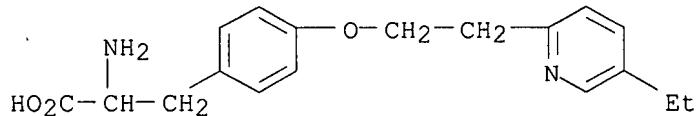
(target intermediate; intermediate compound which is used for the

preparation

of pioglitazone)

RN 795316-22-2 HCPLUS

CN Tyrosine, O-[2-(5-ethyl-2-pyridinyl)ethyl]- (9CI) (CA INDEX NAME)



IT 794591-56-3P, O-[2-(5-Ethylpyridin-2-yl)ethyl]-L-tyrosine

795316-27-7P, O-[2-(5-Ethylpyridin-2-yl)ethyl]-D-tyrosine

RL: IMF (Industrial manufacture); SPN (Synthetic preparation); PREP (Preparation)

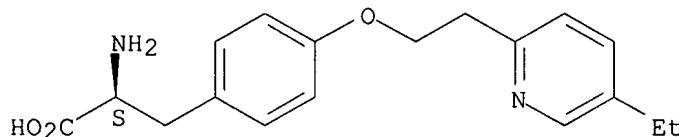
(target intermediate; intermediate compound which is used for the preparation

of pioglitazone)

RN 794591-56-3 HCPLUS

CN L-Tyrosine, O-[2-(5-ethyl-2-pyridinyl)ethyl]- (9CI) (CA INDEX NAME)

Absolute stereochemistry.

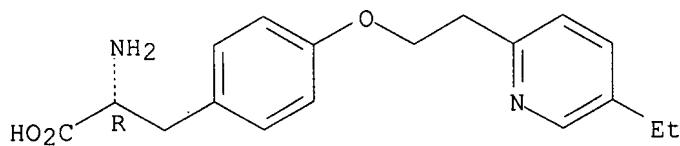


RN 795316-27-7 HCPLUS

10555659

CN D-Tyrosine, O-[2-(5-ethyl-2-pyridinyl)ethyl]- (9CI) (CA INDEX NAME)

Absolute stereochemistry.



REFERENCE COUNT: 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L6 ANSWER 3 OF 7 HCPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 2003:633643 HCPLUS

DOCUMENT NUMBER: 139:180343

TITLE: Preparation of aromatic amino acid derivatives as anticancer agents

INVENTOR(S): Endo, Hitoshi; Kanai, Yoshikatsu; Tsujihara, Kenji; Saito, Kunio

PATENT ASSIGNEE(S): Japan

SOURCE: PCT Int. Appl., 124 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

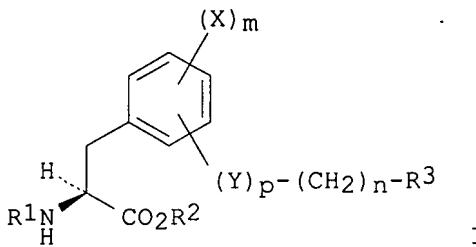
FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---|------|----------|-----------------|------------|
| WO 2003066574 | A1 | 20030814 | WO 2003-JP1081 | 20030203 |
| W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW | | | | |
| RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG | | | | |
| CA 2475434 | A1 | 20030814 | CA 2003-2475434 | 20030203 |
| AU 2003208105 | A1 | 20030902 | AU 2003-208105 | 20030203 |
| EP 1481965 | A1 | 20041201 | EP 2003-703151 | 20030203 |
| R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, SK | | | | |
| US 2005119256 | A1 | 20050602 | US 2003-503125 | 20030203 |
| CN 1630632 | A | 20050622 | CN 2003-803549 | 20030203 |
| PRIORITY APPLN. INFO.: | | | JP 2002-31216 | A 20020207 |
| | | | WO 2003-JP1081 | W 20030203 |

OTHER SOURCE(S): MARPAT 139:180343

GI



AB. Aromatic amino acid derivs. represented by the following general formula (I) or pharmacol. acceptable salts thereof [wherein R1 represents hydrogen or an amino-protecting group; R2 represents hydrogen, alkylaralkyl or aryl; R3 represents (1) halogeno, (2) aroylamino, (3) Ph substituted by lower alkyl, Ph, phenoxy, etc., (4) naphthyl or tetrahydronaphthyl optionally substituted by hydroxy, lower alkoxy or di(lower alkyl)amino, (5) an N-, O- and/or S-containing unsatd. monocyclic heterocycle group substituted by lower alkyl, Ph, naphthyl or tetrahydroquinolyl, or (6) an N-, O- and/or S-containing fused heterocycle group, which may be unsatd. or partly saturated, optionally substituted by oxo, carboxy, amino, lower alkyl, etc.; X represents halogeno, alkyl or alkoxy; Y represents oxygen or nitrogen; p is 0 or 1; m is 0, 1 or 2; and n is an integer of from 0 to 5] are prepared. These compds. inhibit a transporter (LAT1) of essential amino acids which are one of the main nutrients for cancer cells and induce depletion of the essential amino acids in the cancer cells, thereby inhibit the proliferation of the cancer cells. Thus, 0.2 mL pyridine was added to a suspension of N-trifluoroacetyl-3-hydroxy-L-phenylalanine Et ester 159, 2-naphthaleneboronic acid 186, mol. sieve 4A 204, and Cu(OAc)₂ 153 mg in 7 mL CH₂Cl₂, stirred at room temperature for 16 h in air to give, after workup

and

silica gel chromatog., 89% N-trifluoroacetyl-3-(2-naphthyloxy)-L-phenylalanine Et ester (II). 0.5 N aqueous NaOH was added to a solution of II (94 mg) in 2 mL THF at 5°, stirred at 5° for 69 h, acidified with 1 N aqueous HCl to pH 3-4, and filtered to give 78% 3-(2-naphthyloxy)-L-phenylalanine (III). In an assay for a LAT1 inhibitory activity, III and 3-[3-(6-dimethylaminopyridyl)phenoxy]-L-phenylalanine in vitro showed IC₅₀ of 0.1 and 0.01 µg/mL, resp., for inhibiting the uptake of [¹⁴C]-L-tyrosine by human prostatic cancer T24 cells.

IT

579524-57-5P
RL: PAC (Pharmacological activity); RCT (Reactant); SPN (Synthetic preparation); THU (Therapeutic use); BIOL (Biological study); PREP (Preparation); RACT (Reactant or reagent); USES (Uses)

(preparation of aromatic amino acid derivs. as anticancer agents for inhibiting

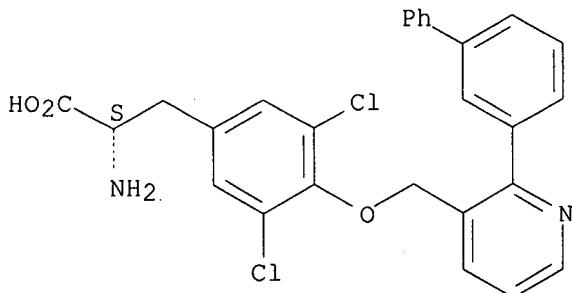
proliferation of cancer cells by inhibiting essential amino acid transporter (LAT1))

RN 579524-57-5 HCPLUS

CN L-Tyrosine, O-[2-[1,1'-biphenyl]-3-yl-3-pyridinylmethyl]-3,5-dichloro- (9CI) (CA INDEX NAME)

Absolute stereochemistry.

10555659



IT 579524-58-6P 579524-59-7P 579524-66-6P

RL: PAC (Pharmacological activity); SPN (Synthetic preparation); THU (Therapeutic use); BIOL (Biological study); PREP (Preparation); USES (Uses)

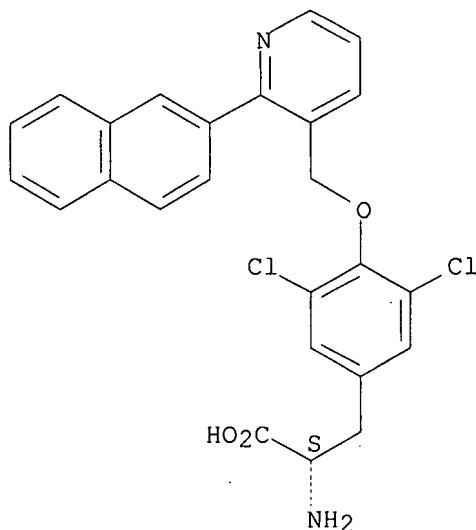
(preparation of aromatic amino acid derivs. as anticancer agents for inhibiting

proliferation of cancer cells by inhibiting essential amino acid transporter (LAT1))

RN 579524-58-6 HCPLUS

CN L-Tyrosine, 3,5-dichloro-O-[(2-(2-naphthalenyl)-3-pyridinyl)methyl]- (9CI)
(CA INDEX NAME)

Absolute stereochemistry.



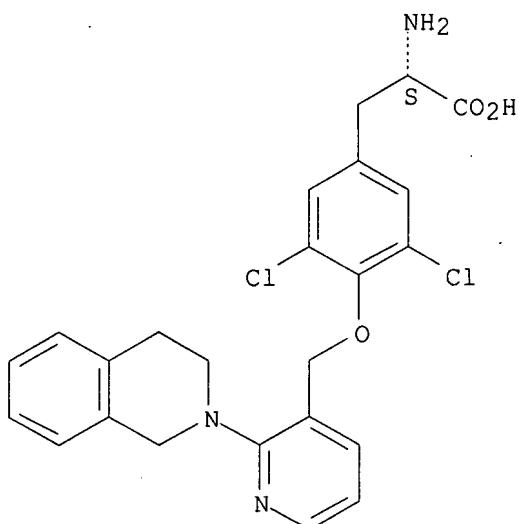
RN 579524-59-7 HCPLUS

CN L-Tyrosine, 3,5-dichloro-O-[(2-(3,4-dihydro-2(1H)-isoquinolinyl)-3-pyridinyl)methyl]- (9CI) (CA INDEX NAME)

Absolute stereochemistry.

Updated Search

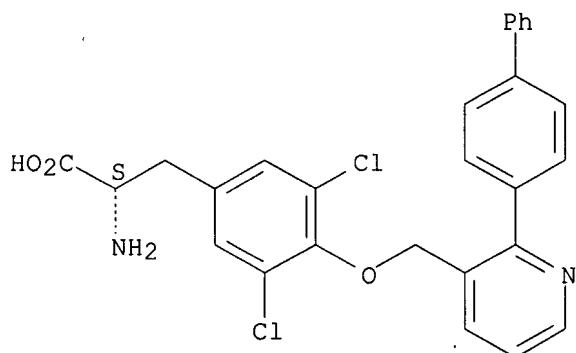
10555659



RN 579524-66-6 HCPLUS

CN L-Tyrosine, O-[(2-[1,1'-biphenyl]-4-yl-3-pyridinyl)methyl]-3,5-dichloro- (9CI) (CA INDEX NAME)

Absolute stereochemistry.



REFERENCE COUNT: 20 THERE ARE 20 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L6 ANSWER 4 OF 7 HCPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 2002:888693 HCPLUS

DOCUMENT NUMBER: 137:385108

TITLE: Preparation of 2-amino-3-[3,5-dibromo-4-(3-bromobenzyl)phenyl]propionic acid and related compounds as thyroid hormone receptor antagonists for cardiac and metabolic disorders

INVENTOR(S): Malm, Johan; Brandt, Peter; Edvinsson, Karin; Ericsson, Thomas; Gordon, Sandra

PATENT ASSIGNEE(S): Karo Bio AB, Swed.

SOURCE: PCT Int. Appl., 40 pp..

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: English

10555659

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---|------|----------|-----------------|------------|
| WO 2002092550 | A1 | 20021121 | WO 2002-EP4193 | 20020415 |
| W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZM, ZW | | | | |
| RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG | | | | |
| CA 2446747 | A1 | 20021121 | CA 2002-2446747 | 20020415 |
| EP 1387825 | A1 | 20040211 | EP 2002-735262 | 20020415 |
| R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR | | | | |
| CN 1509267 | A | 20040630 | CN 2002-809941 | 20020415 |
| JP 2004533450 | T | 20041104 | JP 2002-589436 | 20020415 |
| US 2004220147 | A1 | 20041104 | US 2004-477676 | 20040610 |
| PRIORITY APPLN. INFO.: | | | GB 2001-11861 | A 20010515 |
| | | | WO 2002-EP4193 | W 20020415 |

OTHER SOURCE(S): MARPAT 137:385108

AB Compds. 3,5,4-R2,R3(R1CH2O)C6H2(CH2)nCHR4R5 [I; R1 = (un)substituted (hetero)aryl or cycloalkyl; R2, R3 = Cl, Br, (cyclo)alkyl, alkenyl, alkynyl; R4 = halo, OH, SH, NH2, alkylamino; R5 = CO2H, PO3H2, P(O)(OH)NH2, SO3H, COCO2H, CONHOH; n = 1 or 2], including all possible stereoisomers, prodrug esters, and radioactive forms, were prepared as thyroid receptor ligands, preferably antagonists, for the treatment of cardiac arrhythmias, thyrotoxicosis, subclin. hyperthyroidism, and liver diseases. Thus, the title acid was prepared from Boc-Tyr-OMe (Boc = tert-butoxycarbonyl) by bromination, etherification with 3-bromobenzyl bromide, and deprotection using TFA. I exhibited binding affinities to the thyroid hormone receptor α (ThRa) in the range of 100 nM to 10,000 nM. Compds. I exhibited binding affinities to the ThRa receptor in the range of 10 nM to 10,000 nM.

IT 475999-13-4P 475999-31-6P

RL: DGN (Diagnostic use); PAC (Pharmacological activity); SPN (Synthetic preparation); THU (Therapeutic use); BIOL (Biological study); PREP (Preparation); USES (Uses)

(preparation of amino[(benzyloxy)phenyl]propionic acid derivs. and related compds. as thyroid hormone receptor antagonists for cardiac and metabolic disorders)

RN 475999-13-4 HCPLUS

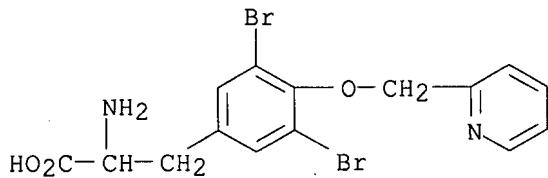
CN Tyrosine, 3,5-dibromo-O-(2-pyridinylmethyl)-, compd. with N,N-diethylethanamine (1:1) (9CI) (CA INDEX NAME)

CM 1

CRN 475999-12-3

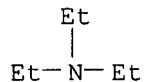
CMF C15 H14 Br2 N2 O3

10555659



CM 2

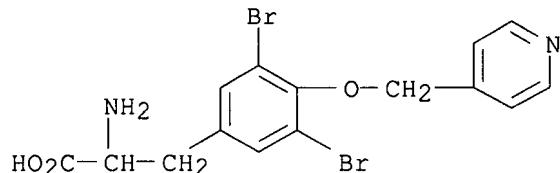
CRN 121-44-8
CMF C6 H15 N



RN 475999-31-6 HCPLUS
CN Tyrosine, 3,5-dibromo-O-(4-pyridinylmethyl)-, compd. with
N,N-diethylethanamine (1:1) (9CI) (CA INDEX NAME)

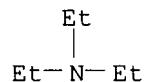
CM 1

CRN 475999-30-5
CMF C15 H14 Br2 N2 O3



CM 2

CRN 121-44-8
CMF C6 H15 N



REFERENCE COUNT: 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS
RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L6 ANSWER 5 OF 7 HCPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2000:863150 HCPLUS
DOCUMENT NUMBER: 134:157200
TITLE: Development of potent and selective plasmin and plasma
kallikrein inhibitors and studies on the
structure-activity relationship

Updated Search

10555659

AUTHOR(S): Okada, Yoshio; Tsuda, Yuko; Tada, Mayako; Wanaka, Keiko; Okamoto, Utako; Hijikata-Okunomiya, Akiko; Okamoto, Shosuke

CORPORATE SOURCE: Faculty of Pharmaceutical Sciences, and High Technology Research Center, Kobe Gakuin University, Kobe, 651-2180, Japan

SOURCE: Chemical & Pharmaceutical Bulletin (2000), 48(12), 1964-1972

PUBLISHER: Pharmaceutical Society of Japan

DOCUMENT TYPE: Journal

LANGUAGE: English

AB Based on structure-activity relationship studies, we designed and synthesized plasmin (PL) and plasma kallikrein (PK) inhibitors. Trans-(4-aminomethylcyclohexanecarbonyl)-Tyr(O-Pic)-octylamide inhibited PL, PK, urokinase (UK) and thrombin (TH) with IC₅₀ values of 0.53, 30, 5.3 and >400 μM, resp. Trans-(4-aminomethylcyclohexanecarbonyl)-Tyr(O-2-Pyrim)-4-carboxyanilide inhibited PL, PK, UK and TH with IC₅₀ values of 36, 0.56, 440 and >1000 μM, resp.

IT 325464-36-6
RL: RCT (Reactant); RACT (Reactant or reagent)
(plasmin and plasma kallikrein inhibitors: structure-activity relationship)

RN 325464-36-6 HCPLUS

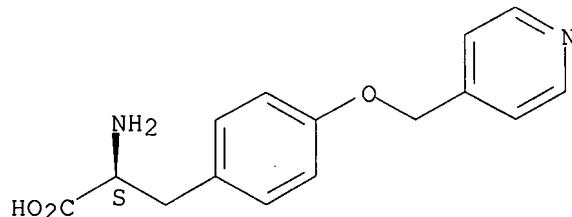
CN L-Tyrosine, O-(4-pyridinylmethyl)-, mono(trifluoroacetate) (9CI) (CA INDEX NAME)

CM 1

CRN 39837-02-0

CMF C15 H16 N2 O3

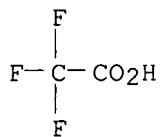
Absolute stereochemistry.



CM 2

CRN 76-05-1

CMF C2 H F3 O2



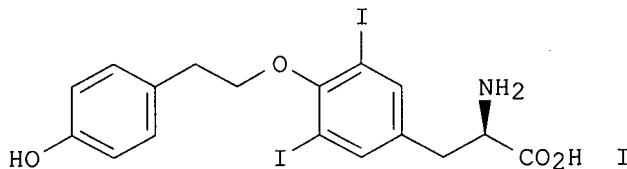
REFERENCE COUNT: 30 THERE ARE 30 CITED REFERENCES AVAILABLE FOR THIS

Updated Search

10555659

RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L6 ANSWER 6 OF 7 HCPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 1996:344485 HCPLUS
DOCUMENT NUMBER: 125:87188
TITLE: Synthesis and SAR of diiodotyrosine-derived glycine-site N-methyl-D-aspartate receptor ligands
AUTHOR(S): Curtis, Neil R.; Kulagowski, Janusz J.; Leeson, Paul D.; Mawer, Ian M.; Ridgill, Mark P.; Rowley, Michael; Grimwood, Sarah; Marshall, George R.
CORPORATE SOURCE: Merck Sharp & Res. Lab., Neurosci. Res. Centre, Harlow, CM20 2QK, UK
SOURCE: Bioorganic & Medicinal Chemistry Letters (1996), 6(10), 1145-1150
CODEN: BMCLE8; ISSN: 0960-894X
PUBLISHER: Elsevier
DOCUMENT TYPE: Journal
LANGUAGE: English
GI



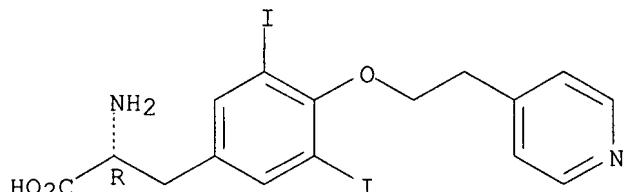
AB A series of analogs of the novel diiodotyrosine derived N-methyl-D-aspartate (NMDA) glycine-site ligand (R)-I was prepared in which the aryl substitution, chain length and amino acid groups were varied. The key structural features for binding are the α -amino acid function, having the (R)-absolute stereochem., the 3,5-diido substituted aromatic ring and a lipophilic group attached at the tyrosine phenolic oxygen.

IT 178666-05-2P
RL: BAC (Biological activity or effector, except adverse); BSU (Biological study, unclassified); SPN (Synthetic preparation); BIOL (Biological study); PREP (Preparation)
(preparation and structure-activity of diiodotyrosine-derived glycine-site methylaspartate receptor ligands)

RN 178666-05-2 HCPLUS

CN D-Tyrosine, 3,5-diido-0-[2-(4-pyridinyl)ethyl]- (9CI) (CA INDEX NAME)

Absolute stereochemistry.



L6 ANSWER 7 OF 7 HCPLUS COPYRIGHT 2007 ACS on STN

Updated Search

10555659

ACCESSION NUMBER: 1973:4506 HCPLUS
DOCUMENT NUMBER: 78:4506
TITLE: Protection of thiol and phenolic hydroxy-groups as
their 4-picollyl ethers, cleaved by electrolytic
reduction
AUTHOR(S): Gosden, A.; Stevenson, D.; Young, G. T.
CORPORATE SOURCE: Dyson Perrins Lab., Oxf. Univ., Oxford, UK
SOURCE: Journal of the Chemical Society, Chemical
Communications (1972), (20), 1123-4
CODEN: JCCCAT; ISSN: 0022-4936

DOCUMENT TYPE: Journal
LANGUAGE: English

AB The 4-picollyl group (Pic), removable by electrolytic reduction, was used to protect the thiol group of cysteine and the hydroxy group of tyrosine during peptide synthesis. Thus, reduction of L-cysteine with Na in liquid NH₃ followed by treatment with PicCl gave 68% Pic-Cys which with BocN₃ (Boc = Me₃COCO) gave 87% Boc-Cys-Pic (I). Gly-OEt with I and dicyclohexylcarbodiimide followed by hydrolysis with aqueous NaOH gave Boc-Cys(Pic)-Gly which on electrolytic reduction followed by air oxidation gave 75% Gly-Cys-Cys-Gly. Similarly Pic-Tyr was used in the preparation of Tyr-Gly.

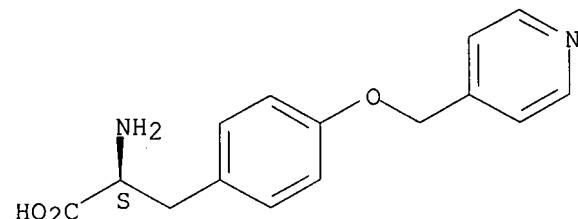
IT 39837-02-0P

RL: SPN (Synthetic preparation); PREP (Preparation)
(preparation of)

RN 39837-02-0 HCPLUS

CN L-Tyrosine, O-(4-pyridinylmethyl)- (9CI) (CA INDEX NAME)

Absolute stereochemistry.



| => file caold | SINCE FILE | TOTAL |
|--|------------|---------|
| COST IN U.S. DOLLARS | ENTRY | SESSION |
| FULL ESTIMATED COST | 47.29 | 395.96 |
| DISCOUNT AMOUNTS (FOR QUALIFYING ACCOUNTS) | SINCE FILE | TOTAL |
| CA SUBSCRIBER PRICE | ENTRY | SESSION |
| | -5.46 | -5.46 |

FILE 'CAOLD' ENTERED AT 11:19:28 ON 09 APR 2007
USE IS SUBJECT TO THE TERMS OF YOUR STN CUSTOMER AGREEMENT.
PLEASE SEE "HELP USAGETERMS" FOR DETAILS.
COPYRIGHT (C) 2007 AMERICAN CHEMICAL SOCIETY (ACS)

FILE COVERS 1907-1966
FILE LAST UPDATED: 01 May 1997 (19970501/UP)

This file contains CAS Registry Numbers for easy and accurate substance identification. Title keywords, authors, patent